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In The Claims:

(Currently Amended) A method of making an optical waveguide, comprising
providing a substrate comprising a semiconductor layer disposed on a first
insulating layer;

forming an opening through said semiconductor layer to said first insulating layer;

depositing a core material on said first insulating layer to fill filling said opening

with a core material;

removing excess core material; and depositing a top cladding layer over the core material.

- 2. (Previously Presented) A method according to claim 1 wherein said semiconductor layer comprises at least one material selected from the group consisting of silicon, silicon-germanium, gallium arsenide, indium gallium arsenide and indium phosphide.
- 3. (Previously Presented) A method according to claim 1 wherein said semiconductor layer is silicon.
- 4. (Previously Presented) A method according to claim 3 wherein said first insulating layer and said top cladding layer are of silicon oxide, each layer having a different refractive index.
- 5. (Original) A method according to claim 1 wherein excess core material is removed by chemical mechanical polishing.
- 6. (Currently Amended) A method of making an optical waveguide, comprising: providing a substrate comprising a semiconductor layer disposed on a first insulating layer;

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depositing a silicon oxide layer over a silicon nitride layer on said semiconductor layer;

depositing a masking layer on said silicon oxide layer;
masking and patterning an opening in said masking layer;
etching through the silicon oxide and silicon nitride layers to form a hard mask;
etching an opening in said semiconductor layer to the first insulating layer;
depositing a core material on the first insulating layer to fill filling said opening
with a core material;

planarizing the core <u>material</u> to remove said silicon oxide layer;

removing said silicon oxide layer and etching said silicon nitride layer; and depositing a top cladding layer having a different refractive index than the core material.

- 7. (Previously Presented) A method according to claim 6 wherein said semiconductor layer is silicon.
- 8. (Previously Presented) A method according to claim 6 wherein said substrate further comprises a second insulating layer having the first insulating layer disposed thereon.
- 9. (Currently Amended) A method according to claim 1 further-comprising: wherein said substrate further comprises:
 - a second insulating layer having the first insulating layer disposed thereon.
- 10. (Previously Presented) A method according to claim 9, wherein the second insulating layer and the first insulating layer are comprised of the same material.

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- 11. (Previously Presented) A method according to claim 9, wherein the second insulating layer is comprised of glass.
- 12. (Previously Presented) A method according to claim 9, wherein the second insulating layer is comprised of silicon oxide.
- 13. (Previously Presented) A method according to claim 1 further comprising: a bottom cladding layer disposed in the opening and having a refractive index different than the top cladding layer.
- 14. (Currently Amended) A method according to claim 4 13, wherein the bottom cladding layer is comprised of glass.
- 15. (Previously Presented) A method according to claim 9, wherein the core material forms an optical waveguide cladded by the first insulating layer and the top cladding layer.
- 16. (Previously Presented) A method according to claim 6 further comprising: conformally depositing a bottom cladding layer in said opening having a different refractive index than said core material.
- 17. (Previously Presented) A method according to claim 16, wherein the bottom cladding layer is silicon oxide.
- 18. (Previously Presented) A method according to claim 16, wherein the step of planarizing further comprises:

removing a portion of the bottom cladding layer.

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- 19. (Previously Presented) A method according to claim 6, wherein the first insulating layer is comprised of at least one of glass or silicon oxide.
- 20. (Cancelled)
- 21. (New) A method of making an optical waveguide, comprising:

 providing a substrate comprising a silicon semiconductor layer disposed on a first insulating layer;

forming an opening through said semiconductor layer to said first insulating layer; filling said opening with a core material;

removing excess core material; and

depositing a top cladding layer over the core material, wherein said first insulating layer and said top cladding layer are of silicon oxide, each layer having a different refractive index.

22. (New) A method of making an optical waveguide, comprising:

providing a substrate comprising a semiconductor layer disposed on a first insulating layer;

second insulating layer having a first insulating layer disposed thereon;

forming an opening through said semiconductor layer to said first insulating layer;

filling said opening with a core material;

removing excess core material; and

depositing a top cladding layer over the core material, wherein the second insulating layer and the first insulating layer are comprised of the same material.

23. (New) A method of making an optical waveguide, comprising:

providing a substrate comprising a semiconductor layer disposed on a first insulating layer;

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second insulating layer having a first insulating layer disposed thereon, wherein the second insulating layer is comprised of glass;

forming an opening through said semiconductor layer to said first insulating layer; filling said opening with a core material; removing excess core material; and depositing a top cladding layer over the core material.

24. (New) A method of making an optical waveguide, comprising:

providing a substrate comprising a semiconductor layer disposed on a first insulating layer;

second insulating layer having a first insulating layer disposed thereon, wherein the second insulating layer is comprised of silicon oxide;

forming an opening through said semiconductor layer to said first insulating layer; filling said opening with a core material; removing excess core material; and depositing a top cladding layer over the core material.

(New) A method of making an optical waveguide, comprising:

providing a substrate comprising a semiconductor layer disposed on a first insulating layer;

second insulating layer having a first insulating layer disposed thereon; forming an opening through said semiconductor layer to said first insulating layer;

filling said opening with a core material;

removing excess core material; and

depositing a top cladding layer over the core material, wherein the core material forms an optical waveguide cladded by the first insulating layer and the top cladding layer.